Evaluation Of Pulse Polio Immunization

(National Immunization Days, India, 1995 – 96)

Department of

Ministry of Health and Family Welfare

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EVALUATION OF

PULSE POLIO IMMUNIZATION (NATIONAL IMMUNIZATION DAYS) (PPI)

INDIA

1995-96

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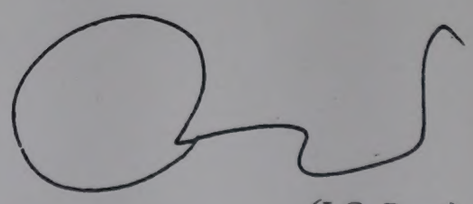
FOREWORD

The Pulse Polio Immunization conducted on 9th December 1995 and 20th January 1996 was the largest one-day public health intervention carried out twice throughout the country which reached 87 million children on the first day on 9th December 1995 and 93 million on the second day on 20th January 1996. To know our areas of weakness which need strengthening, two evaluations were carried out on these rounds. One was a process evaluation conducted on the first day which gave us valuable insights into the bottlenecks faced at the field level and helped us to correct these problems in time before the second round. After the successful completion of the second round, a second comprehensive evaluation to know the coverage achieved in 16 large States, the north eastern States, the Union Territories and the slums of 19 cities with population of more than 1 million was carried out with the help of UNICEF. While by and large, the coverage has been extremely satisfactory, the survey has identified pockets of low coverage especially in urban areas which need greater attention and planning for the next rounds of PPI.

I wish to express my sincere thanks to UNICEF for helping in conducting these evaluations, Dr. Padam Singh and Dr. R.J. Yadav of the Institute for Research in Medical Statistics, New Delhi for their help in the study design and later the analysis of the results and to all the investigators who participated in the evaluation and helped us with this rich source of valuable feedback.

I wish the next rounds of PPI even greater success.



New Delhi
August 15th, 1996

(J.C. Pant)
Secretary (FW)

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EXECUTIVE SUMMARY

1.1 Background : Under the Pulse Polio Immunization (PPI) launched by Ministry of Health and Family Welfare, Government of India, for eradication of poliomyelitis in India, two doses of Polio were given one each on December 9, 1995 and January 20, 1996. The children covered under the programme were those who were born on or after 1.1.1993. There was a political commitment leading to unprecedented social mobilization for immunization of children under the programme. An evaluation of this programme was undertaken in all major states, slums of cities with a population of more than 1 million.

1.2 Methodology : Cluster sampling technique as used in coverage evaluation surveys with modification has been used in the study. In view of varying sizes of the States, the number of clusters selected were 90 in Uttar Pradesh, 60 each in Maharashtra, Madhya Pradesh & Bihar and 30 each in the remaining states/UTs. The clusters in each case were selected by PPS systematic sampling using 1991 census population. In the cities, 30 clusters of slums were selected by random cluster sampling, out of available slum population information. In each cluster 20 children under 3 years of age have been selected. The sampling frame comprised of villages and urban wards. The information collected relate to background characteristics of households, immunization coverage, source of awareness and reasons for non-immunization.

1.3 Sample Characteristics : The sample comprised of 520 villages and 170 wards covering over 13800 children. The immunization booths were within the village/ward in 89 percent of the cases. The distribution of sample villages by size and wards were broadly in accordance with their share in India's population. Further, the characteristics of the sample households were in line with the NFHS and the Census.

1.4 Coverage Levels : The programme reached over 97 percent of target children. As high as 88.3 per cent of the target children could be covered for the first dose and another 10.1 percent for the second dose in addition to covering the children who received the first dose. About 86 percent of the children received both the doses. Those receiving only the second dose were 10.1 percent. Further 2.8 percent received only the first dose. About 2.5 percent received none of the doses.

State-wise results indicate more than 90 percent coverage for both the doses in 4 States (Haryana, Assam, Himachal Pradesh and Kerala and UTs), 85 to 90 percent in 6 States (Karnataka, Madhya Pradesh, Orissa, Punjab, Tamil Nadu and Uttar Pradesh) between 80 to 85 percent in 4 States (West Bengal, Gujarat, Maharashtra and Bihar); and less than 80 in Andhra Pradesh, Rajasthan and North Eastern States.

The coverage in urban slums indicated that 86% of the children received both doses. Apart from this 8% received a single dose on 20th Jan. and 2.5% received a single dose on 9th December 95. Ten city slums had coverage over 90%, another 3 city slums had coverage in the range of 80-85%. Six city slums (Patna, Jaipur, Surat, Delhi, Lucknow and Ludhiana) had less than 80% coverage.

1.5 Coverage levels by background characteristics : Although there are State to State variations, the coverage levels were broadly same for male as well as female children. The coverage levels although lower for the age 0-6 months were also not significantly different by age. Further, the coverage levels were broadly similar in urban and rural areas.

Coverage levels were significantly different among various religious groups, it being lower among Muslims as compared to others. By caste groups (SC, ST & others) also the coverage levels indicated significant difference. The levels were much lower among SC/ST as compared to others. Coverage levels showed significant differences with the literacy level of parents. The coverage levels were lower for illiterate parents.

1.6 Reason for non-immunization : Lack of awareness is no more the reason for non-immunization even for those who did not avail this facility. However, 'Not aware of the days' was reason expressed by one fourth among those who did not receive any of the doses. The other reasons cited were having no faith and absent on the day of immunization. The reasons reported for partial immunization were mainly absent/out of station, not aware of the days. Other important reasons for non-immunization/partial immunization were child being too small and as advised by the doctor.

1.7 Source of awareness : The main source ofawareness for most of the beneficiary households were health workers. Anganwadi workers were next to contribute in generating the awareness. T.V. also played a key role in generating awareness about the programme. Even among those who did not avail of any of the doses, 80 percent were aware of the programme.

2. RECOMMENDATIONS

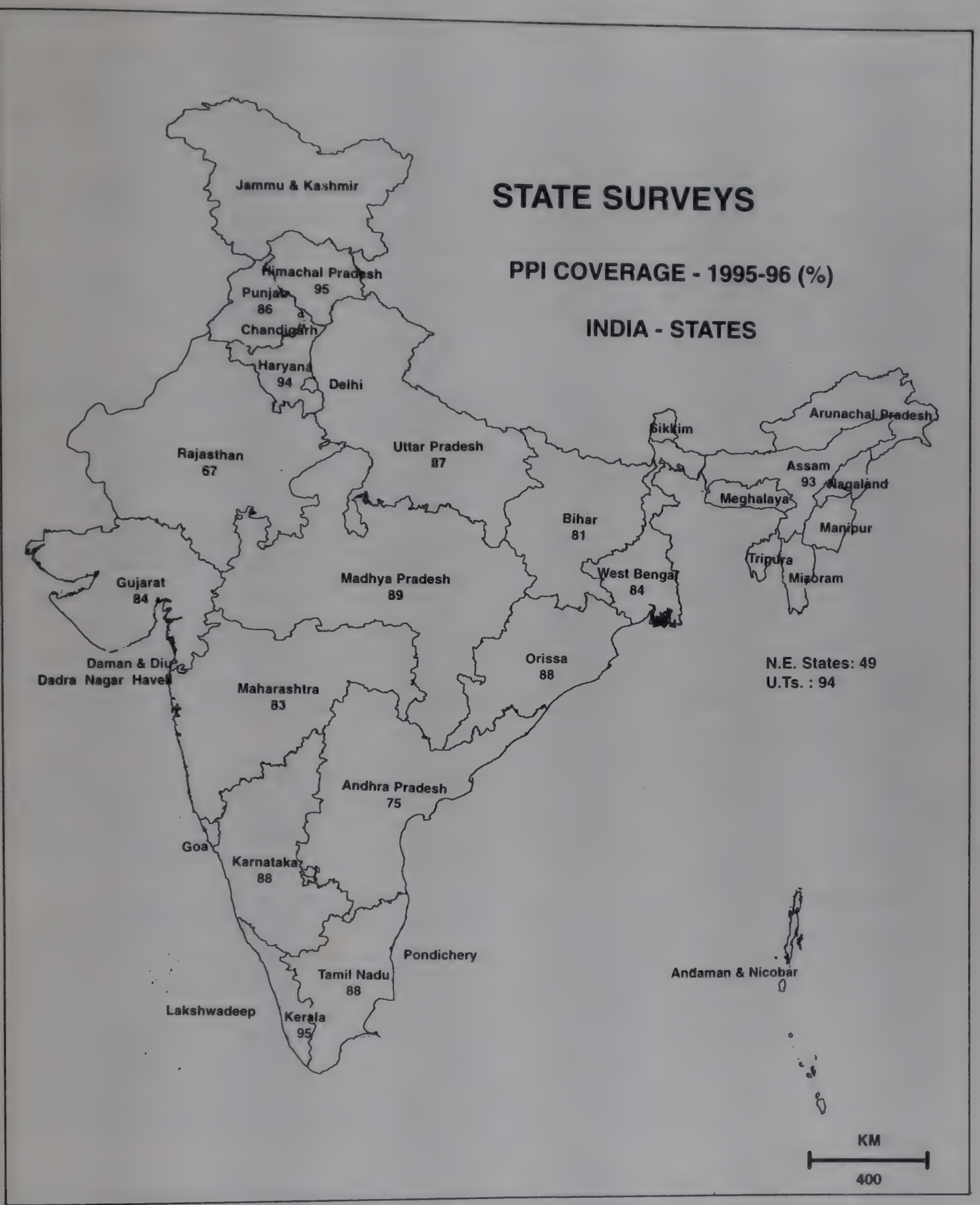
The success of the programme suggests its replicability in future as well as its application to other components of health and family welfare programme.

There has been an all round awareness to the programme leading to this unprecedented success. Thus creating the awareness through appropriate social mobilization and IEC is the key to the success of the programme.

Health workers and anganwadi workers as also teachers and Sarpunch who have close contact with the community serve as key operators in creating the awareness. Mass media specifically T.V. also plays significant role in generating the awareness.

The message regarding utilization of the immunization facility any where in the country needs to be emphasized in future.

In spite of impressive performance of the programme, the coverage levels were lower in some States. These were lower for female children as compared to male children in some of the States. Also in some cases coverage were lower in rural areas as compared to urban areas. For SC/STs coverage levels were generally lower as compared to others. The programme should focus on these target groups and areas in future.


STATE SURVEYS
PPI COVERAGE - 1995-96 (%)
INDIA - STATES
Jammu & Kashmir
Himachal Pradesh
95
Punjab
86
Chandigarh
Haryana
94
Delhi
Rajasthan
67
Uttar Pradesh
87
Sikkim
Arunachal Pradesh
Assam
93
Nagaland
Meghalaya
Bihar
81
Manipur
Tripura
Mizoram
West Bengal
84
Gujarat
84
Madhya Pradesh
89
Orissa
88
Daman & Diu
Dadra Nagar Haveli
Maharashtra
83
N.E. States: 49
U.Ts. : 94
Andhra Pradesh
75
Goa
Karnataka
88
Pondichery
Tamil Nadu
88
Andaman & Nicobar
Lakshwadeep
Kerala
95
KM
400

1 INTRODUCTION

1.1 Background: During the May 1988 World Health Assembly, a resolution was passed to achieve the goal of polio eradication by the year 2000. The goal of polio eradication is defined as no cases of clinical poliomyelitis associated with wild poliovirus and no wild poliovirus found despite intensive efforts to do so.

In India the Universal Immunization Programme has been able to increase the oral polio vaccine (OPV) coverage levels among infants to over 90 per cent for 4 successive years, which is commendable achievement, and the number of polio cases have dropped significantly.

The Government of India has decided to implement the strategy of National Immunization Days i.e. Pulse Polio Immunization, beginning in 1995 to achieve polio eradication by the year 2000. Pulse Polio Immunization (PPI) is:

* The administration of OPV to all children, in India, 0-3 years of age on one single day, irrespective of previous Immunization status. This is repeated 4-6 weeks later. The purpose of PPIs is to reduce the circulation of the wild polio viruses.
* PPIs are organised during the low transmission season of polio viruses between November to February in India. The peak transmission is from May to September.
* These additional rounds are the addition to sustaining high levels of immunization coverage of at least 80% in infants with three doses of oral polio vaccine (OPV) all through the year.

Ministry of Health and Family Welfare Government of India launched the Pulse Polio Immunization (PPI), country wide for eradication to poliomyelitis. Two doses of Polio were given one each on December 9, 1995 and January 20. 1996. Both these days were declared as National Immunization Days. The children covered under the programme were those who were born on or after 1.1.1993. There was political commitment to the programme leading to unprecedented social mobilization and immunization of children under three years of age.

An evaluation of this programme has been undertaken. The evaluation in addition to covering all major states, also covered towns with population more than 1 million tor studying the targeted children in slum areas. The details of towns with more than 1 million population are given in table 1.1. The details of Slum population in towns of different states are given in Appendices 1 and 2.

1.2 Methodology: Cluster sampling technique as used in coverage evaluation surveys with a little modification has been used in the present study. The sample comprised of 30 clusters in the states and slums in cities selected by PPS systematic sampling. In each selected cluster 20 children upto 3 years of age were selected. For the selection of desired number of children in the clusters the investigator divided the village / ward into 4 quadrants. In each quadrant number of houses were estimated and a random number chosen within the number equal to the total houses. In each quadrant, starting with the randomly selected household, the survey was continued till 5 children in the age group of 0-36 months were covered. The information collected relate to background characteristics of households, immunization coverage, source of information reasons for non-immunization etc.

1.3 This is the consolidated report of the study. The first portion of this report is for the surveys conducted in the state and the second portion is that of slums of cities with over a million population.

2. GENERAL PROFILE OF THE STATES

2.1 Population and Demographic Characteristics: According to the census 1991, India had a population of about 846 million. About 70 per cent of the inhabitants live in rural areas. Scheduled Castes comprised 16.7 per cent of the population and Scheduled Tribes for 8 per cent. According to the 1991 Census, the literacy rate for the population age 7 years and above was 52 per cent for India. The literacy rates were 64 per cent for males and 39 per cent for females.

2.2 Vital Rates : The crude birth rate was 29.2 births per 1000 population for the country. The crude death rate for the country was 8.5 deaths per 1000 population. The infant mortality rate for the country for the year 1992 was 79 deaths per 1000 live births. The life expectancy at birth was 58 years. The inter-state variations in vital rates are presented in annexure-1.

3. PROFILE OF SAMPLE VILLAGES/WARDS:

3.1 Population size: The overall sample covered 690 clusters comprising of 520 villages and 170 urban wards. The sample comprised of 11 per cent small villages (< 500), 15 per cent medium size villages (500-1000), 19 per cent large villages (1000-2000) 30 as very large villages (> 2000) and about 25 per cent urban wards. Thus, the proportion of urban wards and villages of different sizes is broadly in proportion to their share in the population.

TABLE 3.1

DISTRIBUTION OF VILLAGES/WARD BY POPULATION SIZE (Per cent)

STATE	SMALL	MEDIUM	LARGE	VERY LARGE	URBAN
ANDHRA PRADESH	6.6	3.3	16.7	46.7	26.7
ASSAM	13.3	16.7	30.0	23.3	16.7
BIHAR	6.7	18.3	25.0	41.6	8.4
GUJARAT	3.3	6.7	3.3	53.4	33.4
HARYANA	0.0	3.3	16.7	60.0	20.0
HIMACHAL PRADESH	56.7	20.0	10.0	3.3	10.0
KARNATAKA	10.0	20.0	13.3	26.7	30.0
KERALA	0	.0	0	73.3	26.7
MADHYA PRADESH	20.0	13.3	16.7	25.0	25.0
MAHARASHTRA	0.0	11.7	21.7	28.3	38.3
ORISSA	20.0	30.0	23.3	23.4	13.3
PUNJAB	3.3	10.0	26.7	26.7	33.3
RAJASTHAN	10.0	26.7	23.3	23.3	16.7
TAMIL NADU	0.0	13.3	13.3	46.7	26.7
UTTAR PRADESH	7.8	14.4	27.8	31.2	18.8
WEST BENGAL	6.6	16.7	13.8	36.7	26.7
NORTH EAST	20.8	12.5	8.3	29.2	29.2
UNION TERRITORIES	3.9	11.5	0	30.8	53.8
ALL INDIA	11.1	15.1	19.6	29.6	24.6
ALL INDIA (CENSUS)	9.6	14.2	18.2	31.9	26.1

3.2 Distance of Health Facility and immunization booth: In about 89 per cent of the cases booths for immunization were within the village/ward and in remaining 11 per cent outside the village/ward. For states like Andhra Pradesh, Karnataka, Kerala, Maharashtra, Punjab and Tamil Nadu, all the booths were within the village/ward. Only in two States, namely Orissa (more than 55 per cent) and in Himachal Pradesh (about 45 per cent) the large number of booths were outside the village/ward. In the States of Bihar, Gujarat, Haryana and Madhya Pradesh, North East States and Union Territories in less than 10 per cent cases booths were outside the village/ward. In 3 States (Assam, U. P. and Rajasthan), 10-20 per cent of booths were outside the village/ward. In West Bengal 23 per cent of villages/wards had booths outside the village/ward.

TABLE 3.2

DISTRIBUTION OF VILLAGES/WARD BY DISTANCE FROM HEALTH FACILITY AND IMMUNIZATION BOOTH (Per cent)

STATE	WITHIN THE VILLAGE	OUTSIDE THE VILLAGE		
		<½km	½-km	>1 km
ANDHRA PRADESH	100.0	-	-	-
ASSAM	86.7	-	-	13.3
BIHAR	93.3	1.7	1.7	3.3
GUJARAT	96.7	-	-	3.3
HARYANA	96.7	3.3	-	-
HIMACHAL PRADESH	56.7	-	23.3	20.0
KARNATAKA	100.0	-	-	-
KERALA	100.0	-	-	-
MADHYA PRADESH	96.7	0	1.7	1.7
MAHARASHTRA	100.0	0	0	0
ORISSA	43.4	3.3	10.1	43.4
PUNJAB	100.0	-	-	-
RAJASTHAN	80.0	-	-	20.0
TAMIL NADU	100.0	-	-	-
UTTAR PRADESH	84.4	3.3	5.6	6.7
WEST BENGAL	76.7	6.7	13.3	3.3
NORTH EAST	91.7	0	0	8.3
UNION TERRITORIES	92.0	0	0	8.0
ALL INDIA	89.0	1.1	3.3	6.6

4. PROFILE OF SAMPLE HOUSEHOLDS

4.1 Socio-Economic Characteristics : This section presents the information on the profile of sample households. Hindus accounted for 81 per cent of sample households and Muslims for 11 per cent. About 19 per cent households belonged to Scheduled Castes. Scheduled Tribes were 10 per cent. In about 80 per cent of the cases the fathers of the children were literate. As to the literacy of the mother about 58 per cent were literate. It is worth mentioning that the literacy in NFHS relate to married women aged 13-49 years and their husbands but and that in the survey for the parents of children upto 3 years of age. Hence, the sample in the present survey comprised of relatively younger couples as compared to NFHS who are likely to have higher literacy. Also survey figure relate to 1996 and hence expected to be higher as compared to NFHS figure which relate to 1992-93. The characteristics of sample households are broadly in line with those of the NFHS and the Census.

TABLE 4.1

SOCIO-ECONOMIC CHARACTERISTICS OF SAMPLE HOUSEHOLDS (Percentage)

	NUMBER	SURVEY	NFHS
RELIGION			
HINDU	11196	81.1	82.0
MUSLIM	1502	10.9	12.0
CHRISTIAN	526	3.8	2.4
JAIN	30	0.2	0.5
SIKH	442	3.2	1.9
OTHERS	116	0.8	1.2
OVERALL	13812	100.0	100.0
CASTE			
SC	2561	18.5	16.7
ST	1434	10.4	8.0
OTHERS	9817	71.1	75.3
OVERALL	13812	100.0	100.0
EDUCATION OF MOTHER			
ILLITERATE	5825	42.2	63.1
PRIMARY	2153	15.6	18.4
MIDDLE	1845	13.4	7.2
SECONDARY	1902	13.8	7.9
SR. SEC. & ABOVE	2087	15.1	3.4
OVERALL	13812	100.0	100.0
EDUCATION OF FATHER			
ILLITERATE	2941	21.3	34.7
PRIMARY	1935	14.0	25.9
MIDDLE	2285	16.5	12.0
SECONDARY	3155	22.9	18.3
SR. SEC. & ABOVE	3496	25.3	9.1
OVERALL	13812	100.0	100.0

4.2 Sex and Age of the Children : About 55 per cent of the children were males and about 45 per cent were females. The per cent of male and female children as per NFHS was estimated as 51.2 and 48.8 respectively. The children under three years account for about 7.6 per cent of total population.

TABLE 4.2 (a)

DISTRIBUTION OF CHILDREN BY SEX

	NUMBER	PER CENT
MALE	7614	55.1
FEMALE	6192	44.9
OVERALL	13811	100.0

Children below one year of age comprised of 33, between 1-2 years about 37 and between 2-3 years as 30 per cent. There is clustering of children at 6, 12, 18, 24, 30 and 36 months of age possibly due to rounding of age.

TABLE 4.2 (b)

DISTRIBUTION OF CHILDREN BY AGE

AGE (in months)	Percent
1	0.6
2	1.0
3	1.7
4	2.4
5	3.0
6	3.9
7	2.9
8	3.4
9	3.0
10	3.0
11	1.9
12	6.0
13	2.3
14	2.4
15	2.9
16	2.2
17	1.4
18	8.9
19	1.2
20	2.3
21	1.6
22	2.1
23	1.5
24	8.3
25	1.4
26	1.7
27	1.1
28	2.0
29	0.8
30	6.9
31	0.9
32	1.6
33	1.2
34	2.1
35	2.1
36	8.3
OVER ALL	13812 100.0

5. IMMUNIZATION COVERAGE

5.1 About 85.5 per cent of the children received both the doses. Those receiving only the second dose were 10 per cent. Further 2.8 per cent received only the first dose. About 2.6 per cent received none of the doses. Thus, the programme reached over 97 per cent of target children. As high as 88.3 per cent could be covered for the first dose and another 10.1 per cent for the second dose, in addition to covering the children who received the first dose. State-wise results indicate more than 90 per cent coverage for both the doses in 4 States (Haryana, Assam, Himachal Pradesh, Kerala) and U.Ts. combined; 85 to 90 per cent in 6 States (Karnataka, Madhya Pradesh, Orissa, Punjab, Tamil Nadu and Uttar Pradesh); between 80 to 85 per cent in 4 States (Maharashtra, West Bengal, Gujarat and Bihar) and less than 80 per cent in Andhra Pradesh, Rajasthan and North Eastern States.

TABLE 5.1

COVERAGE LEVEL ACCORDING TO SEX, AGE AND RESIDENCE

NONE DOSE I DOSE 11 BOTH

	N	NONE		DOSE I/ONLY		DOSE II/ONLY		BOTH	
		NUMBER	PER CENT	NUMBER	PER CENT	NUMBER	PER CENT	NUMBER	PER CENT
ANDHRA PRADESH	600	19	3.2	14	2.3	115	19.1	452	75.4
ASSAM	600	9	1.5	9	1.5	22	3.7	560	93.3
BIHAR	1211	37	3.1	18	1.5	177	14.6	979	80.9
GUJARAT	637	18	2.8	25	3.9	57	8.9	537	84.3
HARYANA	600	8	1.3	12	2.1	18	3.0	562	93.6
HIMACHAL PRADESH	631	7	1.1	9	1.4	17	2.7	598	94.8
KARNATAKA	600	30	5.0	6	1.0	36	6.0	528	87.9
KERALA	600	3	.5	4	.7	26	4.3	567	94.5
MADHYA PRADESH	1229	18	1.5	20	1.6	91	7.4	1100	89.4
MAHARASHTRA	1200	38	3.2	17	1.4	151	12.6	994	82.8
ORISSA	600	10	1.7	21	3.5	39	6.5	530	88.3
PUNJAB	600	0	0.0	0	0.0	85	14.20	515	85.8
RAJASTHAN	601	19	3.2	13	2.2	169	28.1	400	66.6
TAMIL NADU	607	8	1.3	7	1.2	60	9.9	532	87.6
UTTAR PRADESH	1826	52	2.8	103	5.6	75	4.1	1596	87.4
WEST BENGAL	603	38	6.3	43	7.1	15	2.5	507	84.1
NORTH EAST	547	28	5.1	32	5.9	219	40.0	268	49.0
UNION TERRITORIES	520	10	1.9	4	0.8	15	2.9	491	94.4
ALL INDIA	13812	352	2.6	357	2.8	1387	10.1	11716	85.5

The coverage levels for both doses have been analyzed according to the characteristics of the households and inferences on differences drawn using appropriate tests of significance. The results are discussed in the following sections.

5.2 Sex, Age and Residence : The coverage levels although lower for the age group of 0-6 months, were not significantly different by age at the aggregate level (F = 1.62, d.f. = 5,13805).

TABLE 5.2

COVERAGE LEVEL ACCORDING TO AGE

	AGE					
	0-6	7-12	13-18	19-23	25-30	>31
ANDHRA PRADESH	61.5	77.1	80.2	76.7	68.4	86.7
ASSAM	94.0	92.7	97.6	92.8	94.9	86.2
BIHAR	52.2	75.7	81.1	86.3	91.9	86.5
GUJARAT	78.7	81.3	87.3	86.6	91.9	81.0
HARYANA	94.3	95.3	94.8	93.2	91.1	91.3
HIMACHAL PRADESH	92.9	96.6	97.1	93.4	94.3	93.8
KARNATAKA	82.9	88.1	90.7	91.8	85.9	85.7
KERALA	81.3	94.2	98.9	96.3	96.7	92.9
MADHYA PRADESH	82.6	86.8	92.6	88.1	93.1	92.8
MAHARASHTRA	77.5	87.5	83.9	82.6	73.1	86.2
ORISSA	78.9	88.9	88.8	87.9	93.5	92.3
PUNJAB	80.7	82.0	92.0	89.0	80.7	83.6
RAJASTHAN	50.8	77.2	77.2	64.6	60.5	68.5
TAMIL NADU	69. 5	88.2	87.3	88.9	97.8	87.0
UTTAR PRADESH	77.0	89.7	88.0	88.0	90.2	90.6
WEST BENGAL	78.8	83.8	83.8	89.7	84.6	84.8
NORTH EAST	37.3	52.4	48.1	44.9	52.2	53.2
UNION TERRITORIES	83.6	97.2	93.8	96.0	96.9	96.8
ALL INDIA	81.5	89.8	70.7	90.2	89.5	90.7

5.3 Residence and Sex : At the aggregate, coverage levels were same in rural and urban areas (t= 1.5, d.f. = 13810).

For the States of Andhra Pradesh, Assam, Karnataka, Kerala, Madhya Pradesh, Rajasthan and West Bengal, the coverage levels were higher in urban areas as compared to rural areas. On the other hand for the States of Bihar, Gujarat, Haryana, Himachal Pradesh, Orissa and Uttar Pradesh coverage levels were higher in rural areas as compared to urban areas.

TABLE 5.3

COVERAGE LEVEL ACCORDING TO RESIDENCE AND SEX (Per cent)

	RESIDENCE		SEX	
	RURAL	URBAN	MALE	FEMALE
ANDHRA PRADESH	71.7	85.6	73.6	77.8
ASSAM	92.5	96.6	93.8	92.8
BIHAR	82.0	69.0	83.4	75.9
GUJARAT	88.7	74.5	84.9	83.5
HARYANA	94.6	90.1	93.8	93.4
HIMACHAL PRADESH	95.1	91.8	95.1	94.3
KARNATAKA	87.4	90.7	87.9	87.9
KERALA	92.2	97.1	93.0	96.0
MADHYA PRADESH	87.4	96.1	90.1	88.7
MAHARASHTRA	82.9	82.7	83.3	82.3
ORISSA	88.8	84.8	89.2	87.4
PUNJAB	85.6	85.9	85.8	85.8
RAJASTHAN	65.1	93.5	65.5	68.0
TAMIL NADU	87.1	89.2	88.6	86.7
UTTAR PRADESH	87.9	84.1	87.6	87.2
WEST BENGAL	82.1	91.9	85.9	82.3
NORTH EAST	59.6	43.4	46.0	51.5
UNION TERRITORIES	89.1	97.6	93.4	95.7
ALL INDIA	85.9	84.0	86.1	84.6

The coverage levels were same for male children as well as female children (t = 0.9, d.f. = 13810). For some of the States the differences were significant. The coverage levels were higher for males as compared to females in the States of Bihar by 7 percentage points and in West Bengal by 3 percentage points. In the States of Andhra Pradesh, Kerala and North East the coverage levels for

5.4 Religion and Caste: Coverage levels indicated significant differences among various religious groups. (F = 5.9, d.f. = 5,13805). Coverage levels were higher among Sikhs and Hindus as compared to Muslims. Coverage levels were much lower among Muslims as compared to Hindus in the States of Haryana, Punjab, Himachal Pradesh, Rajasthan and West Bengal. It was reverse in the State of Bihar. By caste groups also the coverage levels indicated significant differences (F = 5.2, d.f. = 2,13808). The coverage levels were lower among SC and ST as compared to others. However, for some of the States, these differences were not significant.

TABLE 5.4

COVERAGE LEVEL ACCORDING TO RELIGION AND CASTE (Per cent)

	RELIGION				CASTE		
	HINDU	MUSLIM	CHRISTIAN	OTHERS	SC	ST	OTHERS
ANDHRA PRADESH	75.4	73.1	84.6	100.0	72.5	86.5	75.1
ASSAM	94.8	90.2	100.0	100.0	69.6	97.3	93.8
BIHAR	80.5	88.0	64.7	100.0	73.6	68.8	87.0
GUJARAT	85.7	81.9	100.0		83.3	90.2	83.0
HARYANA	93.1	77.8	96.4	100.0	95.5	-	93.0
HIMACHAL PRADESH	94.9	81.8	100.0	100.0	94.6	100.0	94.7
KARNATAKA	87.8	87.8	100.0	100.0	83.9	87.0	89.1
KERALA	93.5	94.7	94.5	-	100.0	100.0	93.7
MADHYA PRADESH	89.3	92.5	100.0	100.0	84.4	93.0	89.5
MAHARASHTRA	74.7	75.3	78.9	100.0	76.3	64.5	76.1
ORISSA	87.6	-	100.0	-	83.7	85.5	92.3
PUNJAB	85.6	69.6	87.4	76.9	86.3	92.8	85.4
RAJASTHAN	69.5	50.0	100.0	78.8	61.0	69.7	78.4
TAMIL NADU	87.3	89.5	91.7	-	86.8	87.0	88.0
UTTAR PRADESH	86.8	89.7	100.0	100.0	90.6	84.8	86.7
WEST BENGAL	88.5	68.2	-	100.0	87.3	67.5	84.1
NORTH EAST	40.6	-	65.7	50.0	10.0	49.1	51.0
UNION TERRITORIES	65.5	80.0	93.8	85.7	96.2	86.7	94.2
ALL INDIA	84.9	84.3	83.4	92.4	83.7	84.9	86.7

5.5 Literacy: Coverage levels by literacy of mother and father showed significant differences (F = 6.5, d.f. = 4,13806. The levels were lower for illiterate parents.

TABLE 5.5(a)

COVERAGE LEVEL ACCORDING TO LITERACY (Per cent)

	TOTAL	NONE	DOSE-I ONLY		DOSE-II ONLY		BOTH	
	NO.	%	NO.	%	NO.	%	NO.	%
BOTH ILLITERATE	90	4.0	109	4.7	214	9.1	1927	82.2
LITERATE FATHER & ILLITERATE MOTHER	73	2.3	90	3.2	244	8.6	2425	85.8
LITERATE MOTHER & ILLITERATE FATHER	7	2.3	8	3.1	23	9.0	219	85.5
BOTH LITERATE	156	2.3	102	1.7	567	9.3	5300	86.8

TABLE 5.5(b)

COVERAGE LEVEL ACCORDING LITERACY OF MOTHERS (Per cent)

	ILLITERATE	PRIMARY	MIDDLE	SECONDARY	SR. SECONDARY
ANDHRA PRADESH	72.0	75.9	72.9	87.0	76.9
ASSAM	94.3	86.7	97.2	92.3	95.9
BIHAR	84.1	73.8	77.3	75.6	91.0
GUJARAT	83.9	79.3	86.4	81.0	84.3
HARYANA	94.2	95.3	95.3	94.0	87.2
HIMACHAL PRADESH	88.5	96.6	99.1	96.5	93.2
KARNATAKA	84.1	93.2	92.4	90.1	89.4
KERALA	87.0	98.8	94.7	94.3	91.5
MADHYA PRADESH	86.8	88.1	94.6	96.3	93.8
MAHARASHTRA	87.2	74.5	76.1	77.0	60.0
ORISSA	85.1	93.3	90.8	87.1	92.5
PUNJAB	76.7	83.2	91.6	93.2	81.5
RAJASTHAN	68.9	56.6	73.3	58.8	64.0
TAMIL NADU	89.3	84.0	87.5	92.0	86.4
UTTAR PRADESH	85.3	91.5	92.5	90.0	90.8
WEST BENGAL	76.7	84.9	91.7	98.5	91.7
NORTHEAST	38.7	40.5	81.8	34.8	61.1
UT	81.6	95.5	95.5	95.2	95.7
ALL INDIA	82.5	85.0	85.3	88.2	86.7

TABLE 5.5(c)

COVERAGE LEVELS ACCORDING TO LITERACY OF FATHERS (Per cent)

	ILLITERATE	PRIMARY	MIDDLE	SECONDARY	SR. SECONDARY
ANDHRA PRADESH	72.5	75.0	71.0	75.7	81.3
ASSAM	93.2	92.2	97.3	91.7	94.2
BIHAR	81.4	75.9	75.7	82.3	85.6
GUJARAT	80.8	81.6	86.7	88.0	84.9
HARYANA	94.5	96.6	98.1	97.1	88.9
HIMACHAL PRADESH	80.0	84.3	97.0	96.8	97.2
KARNATAKA	78.3	95.2	89.3	92.4	91.8
KERALA	96.4	91.2	96.4	92.2	96.4
MADHYA PRADESH	85.8	87.2	89.0	87.8	94.9
MAHARASHTRA	95.4	63.1	73.6	86.4	65.5
ORISSA	84.9	92.4	84.7	90.1	88.8
PUNJAB	80.8	82.1	92.0	89.3	81.1
RAJASTHAN	62.5	75.6	69.9	68.8	62.5
TAMIL NADU	87.4	85.4	84.8	91.7	89.0
UTTAR PRADESH	83.9	89.9	90.7	87.9	88.6
WEST BENGAL	73.4	83.3	86.3	91.1	90.4
NORTH EAST	38.7	40.5	81.8	34.8	61.1
UNION TERRITORIES	81.6	95.5	95.5	95.2	95.7
ALL INDIA	82.5	83.3	86.0	87.2	87.8

6. REASONS FOR NON-IMMUNIZATION

6.1 Information on reasons for non-immunization was collected for those who did not receive any of the doses as well as from those who received only the first dose. The results are presented for these two categories in table 6. 1. As already mentioned lack of awareness was no more the reason for non-immunization even for those who did not receive any of the doses. However, not aware of the days of immunization was the reason reported by about one fourth followed by having no faith. In one third of the cases reasons given were not specified. On the other hand reasons for partial immunization were mainly absent on the day of immunization, not aware of the days and child too small.

TABLE 6.1

REASONS FOR NON-IMMUNIZATION (Per cent)

REASON FOR NON IMMUNIZATION	NONE	PARTIAL
NOT AWARE OF DAYS	25.1	16.0
HAVE NO FAITH	13.9	5.2
AS DOCTOR ADVISED	4.6	1.5
NOT CONVINCED	3.7	2.5
RECENTLY VACCINATED	0.9	2.1
NO TIME/NOT CONVENIENT	1.5	1.2
CHILD TOO SMALL	0.6	8.0
OBSTACLE	2.2	0.6
ABSENT	9.3	23.9
FEAR OF DISEASE	0.0	1.2
ON DELIVERY	0 0	0.3
COMPLETED THREE DOSES	0.0	3.1
CHILD ILL	0.3	0.3
NOT INFORMED	0.3	0.3
NOT SPECIFIED	34.1	23.6
NA	3.4	10.1
TOTAL (N)	**352**	**357**

6.2 The analysis of reasons for failure according to sex, age of the child and religion [(table 6.2(a), 6.2(b)] do not indicate any significant difference for these variable.

Table 6.2 (a)

REASONS FOR NON-IMMUNIZATION BY SEX AND AGE

REASONS FOR NON-IMMUNIZATION	SEX		AGE (in months)					
	MALE	FEMALE	0-6	7-12	13-18	19-23	25-30	>31
NOT AWARE OF DAYS	10.1	11.3	9.4	10.0	8.3	12.8	10.2	14.7
HAVE NO FAITH	3.8	4.3	4.3	2.6	3.8	3.6	5.8	5.4
AS DOCTOR ADVISED	4.4	2.2	3.1	3.1	6.7	1.8	1.0	3.6
NOT CONVINCED	1.2	1.6	.9	1.1	1.9	.4	1.0	3.6
RECENTLY VACCINATED	.7	1.0	1.4	1.1	.6	.4	1.5	.0
OTHERS	54.4	52.9	50.9	51.3	56.5	57.7	52.4	54.5
NA	25.3	26.7	30.1	30.8	22.0	23.5	28.2	18.3

Table 6.2 (b)

REASONS FOR NON-IMMUNIZATION BY RELIGION

REASONS FOR NON IMMUNIZATION	RELIGION					
	HINDU	MUSLIM	CHRIST.	JAIN	SIKH	OTHERS
NOT AWARE OF DAYS	9.5	19.4	.0	.0	.0	8.3
HAVE NO FAITH	4.2	1.7	19.0	.0	.0	4.2
AS DOCTOR ADVISED	2.0	3.4	14.3	.0	20.0	66.7
NOT CONVINCED	1.5	1.3	.0	.0	.0	.0
RECENTLY VACCINATED	.8	1.3	.0	.0	.0	.0
OTHERS	54.9	51.7	38.1	100.0	70.0	8.3
NA	27.0	21.1	28.6	.0	10.0	12.5

6.3 Inter State Variation of Reasons for failure : The analysis of State specific reasons for failure of immunization (annexure 2 & 3) indicate that the reasons are broadly the same. However, the proportion of their contribution differed.

7. SOURCE OF AWARENESS

7.1 The main source of awareness for most of the beneficiary households were health workers and Anganwadi workers. T. V. played a key role in generating the awareness. Teacher, relative, friend also served as source of information. It may be mentioned that among those who did not avail of any of the doses, about 80 per cent were aware of the programme.

TABLE 7.1

SOURCE OF AWARENESS (Per cent)

SOURCE	NONE	DOSE I ONLY	DOSE II ONLY	BOTH	OVERALL
HEALTH WORKER	28.8	46.4	37.3	45.7	44.4
ANGANWADI WORKER	8.0	11.1	14.7	18.9	18.0
RELATIVE	3.1	3.3	4.6	2.3	2.6
FRIEND	3.6	8.0	3.3	2.1	2.4
TEACHER	3.6	3.9	7.9	5.4	5.6
TV	11.9	5.8	11.6	10.7	10.7
RADIO	4.7	2.3	6.0	3.1	3.4
OTHERS	15.6	18.8	14.4	11.4	12.0
NEVER HEARD	20.7	0.6	0.2	0.0	0.6
n	352	357	1387	11716	13812

The results at the State level are presented in annexure 4. The health worker remained the main source of awareness in all States and for all categories. Anganwadi worker, teacher, who have contact with the community also contributed towards this. Local specific methods were also employed in different states.

7.2 With a view to understand the differentials, if any, in the source of awareness by religion, caste, residence, literacy, the results according to background characteristics households are presented in tables 7.2 (a) and 7.2(b). Health workers were the main source of awareness among all religious and social groups both in rural and urban areas. Anganwadi workers contributed next to health workers in generating awareness. T.V. played a key role specially in urban areas and among relatively better offs. Relatives and friends also helped towards this among Sikhs and Jains.

TABLE 7.2 (a)

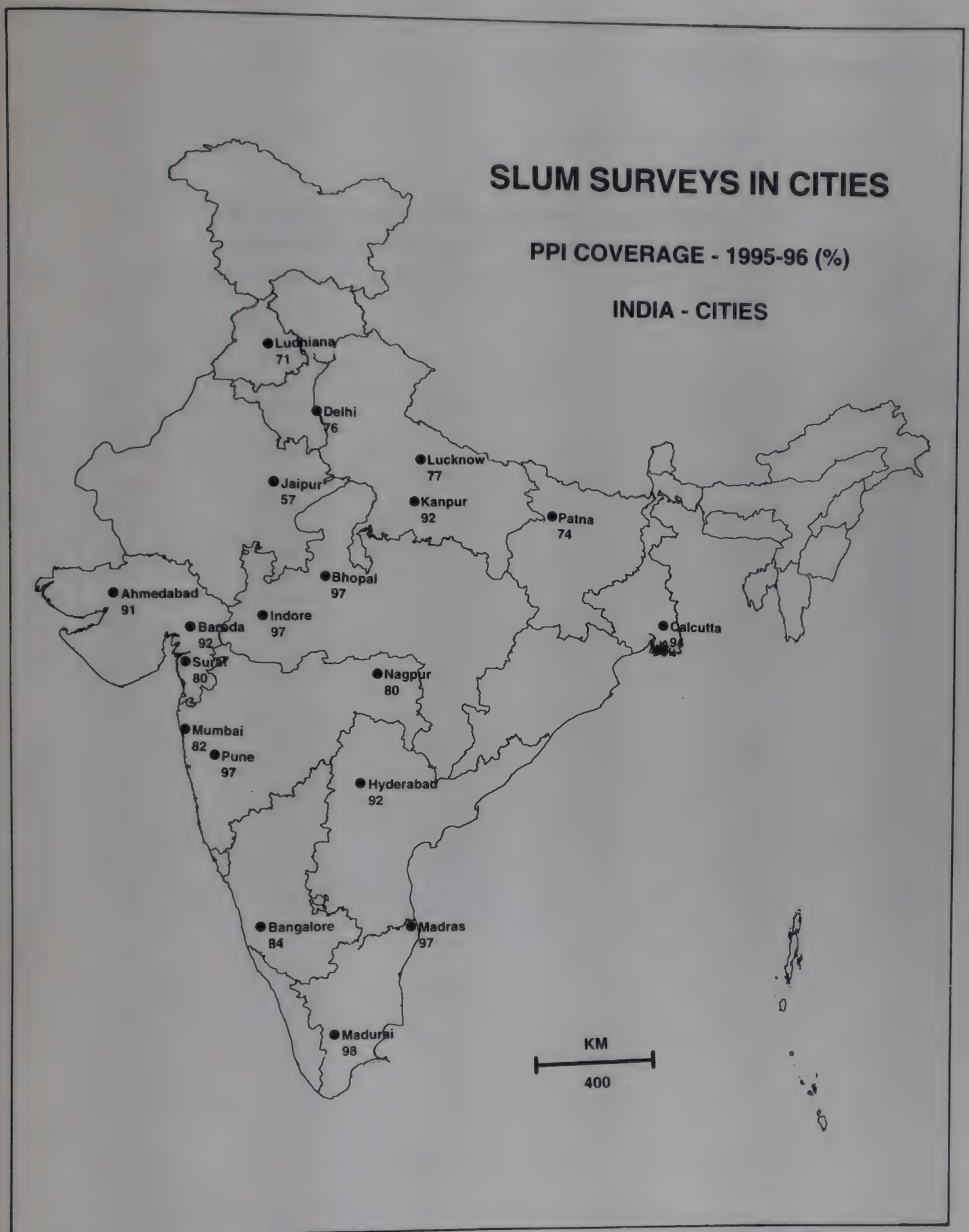
SOURCE OF AWAREWESS BY RELIGION (Per cent)

AWARENESS	RELIGION					
	HINDU	MUSLIM	CHRIST.	JAIN	SIKH	OTHERS
HEALTH WORKER	46.8	47.4	63.9	55.2	13.0	34.6
ANGANWADI WORKER	16.8	14.1	13.1	.0	.0	6.4
RELATIVE	2.3	3.4	2.0	3.4	17.4	6.4
FRIEND	2.0	4.5	2.0	.0	32.6	2.6
TEACHER	6.6	4.4	.8	17.2	.0	5.1
TV	9.3	11.9	7.5	17.2	23.9	23.1
RADIO	3.8	2.7	4.0	6.9	6.5	3.8
OTHERS	10.9	10.0	6.7	.0	6.5	17.9
NEVER HEARD	1.3	1.5	.0	.0	.0	.0

TABLE 7.2 (b)

SOURCE OF AWARENESS BY CASTE AND RESIDENCE (Per cent)

AWARENESS	CASTE			AREA	
	SC	ST	OTHERS	URBAN	RURAL
HEALTH WORKER	47.4	49.6	46.7	43.9	48.0
ANGANWADI WORKER	16.2	23.1	15.3	12.4	17.2
RELATIVE	1.2	2.3	2.9	2.9	2.5
FRIEND	2.6	2.0	2.5	4.3	2.0
TEACHER	8.2	5.4	5.8	3.0	7.0
TV	5.1	2.2	11.9	20.5	6.9
RADIO	6.2	3.2	3.2	3.1	3.9
OTHERS	12.2	11.2	10.3	8.7	11.3
NEVER HEARD	.9	.9	1.5	1.2	1.3



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1. DEMOGRAPHIC PROFILE OF THE TOWNS

TABLE 1.1

BASIC DEMOGRAPHIC INDICATORS OF TOWNS WITH MORE THAN ONE MILLION POPULATION

Sl. No.	Town	State	Total Population			Literacy Rate (7+)			
			Persons	Males	Females	Persons	Males	Females	Sex Ratio
1	Hyderabad	Andhra Pradesh	4344437	2251452	2092985	58.77	67.95	48.96	941
2	Vishakhapatnam	Andhra Pradesh	1057118	545744	511374	72.20	80.99	62.78	937
3	Patna	Bihar	1099647	601244	498403	76.57	83.27	68.32	829
4	Ahmedabad	Gujarat	3312216	1753320	1558896	79.59	86.61	76.68	889
5	Surat	Gujarat	1518950	826087	692863	75.98	82.51	68.05	839
6	Vadodara	Gujarat	1126824	593764	533060	81.96	87.99	75.22	898
7	Bangalore	Karnataka	4130288	2170985	1959303	79.41	85.34	72.38	903
8	Kochi	Kerala	1140605	571169	569436	93.69	96.60	90.90	997
9	Bhopal	Madhya Pradesh	1062771	561208	501563	71.76	79.13	63.44	894
10	Indore	Madhya Pradesh	1109055	583653	525403	76.71	84.56	67.94	900
11	Greater Bombay	Maharashtra	2596243	6891222	5705021	79.23	87.60	79.23	909
12	Nagpur	Maharashtra	1664006	868767	795239	70.26	78.09	62.16	961
13	Pune	Maharashtra	2493987	1310514	1183473	80.97	87.7	73.45	903
14	Ludhiana	Punjab	1042740	580961	461779	71.96	74.39	67.93	795
15	Jaipur	Rajasthan	1518235	812589	705646	69.93	80.31	57.86	868
16	Coimbatore	Tamil Nadu	1100746	570370	530376	79.62	87.11	71.51	930
17	Madras	Tamil Nadu	5421985	2805566	2616419	81.53	88.09	74.06	933
18	Madurai	Tamil Nadu	10885914	555775	530138	82.29	89.54	74.70	954
19	Kanpur	Uttar Pradesh	2029889	1114225	915664	72.18	79.44	73.15	822
20	Lucknow	Uttar Pradesh	1669204	892308	77896	71.04	63.46	63.46	871
21	Varanasi	Uttar Pradesh	1030863	553991	476872	64.24	73.93	52.68	861
22	Calcutta	West Bengal	11021918	6022489	4999429	77.10	82.05	71.05	830
23	Delhi	Delhi	8419084	4601590	3817494	76.24	82.42	68.63	830

1.2 Slum Population : Slum population as percentage of total population of towns ranged from 7.6 per cent in Banglore to 56.5 per cent in Patna town. Sex Ratio ranged from 795 in Ludhiana (Punjab) to 997 in Kochi (Kerala). According to the 1991 census, the literate rate for the population age 7 years ranged from 58.7 in Hyderabad to 93.7 in Kochi (Kerala).

TABLE 2.1

SLUM POPULATION AS PERCENTAGE OF TOTAL POPULATION

CITY	PERCENT
PATNA	56.5
BANGLORE	7.6
NAGPUR	20.0
PUNE	40.0
JAIPUR	20.0
MADRAS	41.5
MADURAI	17.8
AHEMDABAD	20.0
SURAT	19.9
BARODA	20.0
HYDERABAD	20.2
MUMBAI	46.0
INDORE	13.5
BHOPAL	20.0
KANPUR	20.0
LUCKNOW	20.0
CALCUTTA	36.0
DELHI	34.5
LUDHIANA	46.2

3. PROFILE OF SAMPLE WARDS:

3.1 Sample size: The overall sample covered 570 clusters. The sample comprised of 11408 children.

3.2 Distance of immunization booth : In all of the cases booths for immunization were within the ward.

4. PROFILE OF SAMPLE HOUSEHOLDS

4.1 Socio-Economic Characteristics : This section presents the information on the profile of sample households. Hindus accounted for 77 per cent of sample households and Muslims for about 19 per cent. About 30 per cent households belonged to Scheduled Castes. Scheduled Tribes were 6 per cent. In about 80 per cent of the cases the fathers of the children were literate. As to the literacy of the mother about 60 per cent were literate.

TABLE 4.1

SOCIO-ECONOMIC CHARACTERISTICS OF SURVEYED SAMPLE (Percentage)

	Number	Survey
RELIGION		
HINDU	8810	77.2
MUSLIM	2112	18.5
CHRIST.	201	1.8
JAIN	31	.3
SIKH	131	1.1
OTHERS	123	1.1
OVERALL	11408	100.0
CASTE		
SC	3366	29.5
ST	683	6.0
OTHERS	7359	64.5
OVERALL	11408	100.0
EDUCATION OF MOTHER		
ILLITERATE	4555	39.9
PRIMARY	1817	15.9
MIDDLE	1735	15.2
SECONDARY	1547	13.6
SR.SEC. & ABOVE	1754	15.4
OVERALL	11408	100.0
EDUCATION OF FATHER		
ILLITERATE	2406	21.1
PRIMARY	1710	15.0
MIDDLE	2080	18.2
SECONDARY	2380	20.9
SR.SEC. & ABOVE	2832	24.8
OVERALL	11408	100.0

TABLE 4.2 (a)

DISTRIBUTION OF CHILDREN BY SEX

	Number	Per cent
MALE	5969	52.3
FEMALE	5439	47.7
OVERALL	11408	100.0

Children below one year of age comprised of 34, between 1-2 years about 35 and between 2-3 years as 31 per cent. There is clustering of children at 6, 12, 18, 24, 30 and 36 months of age possibly due to rounding of age.

TABLE 4.2 (b)

DISTRIBUTION OF CHILDREN BY AGE

Age in (months)	Number	Per cent
0	1	0
1	64	6
2	139	1.2
3	188	1.6
4	281	2.5
5	316	2.8
6	442	3.9
7	346	3.0
8	385	3.4
9	332	2.9
10	324	2.8
11	211	1.8
12	818	7.2
13	178	1.6
14	246	2.2
15	325	2.8
16	217	1.9
17	104	9
18	1114	9.8
19	94	8
20	239	2.1
21	153	1.3
22	179	1.6
23	108	9
24	1071	9.4
25	106	9
26	186	1.6
27	173	1.5
28	236	2.1
29	63	.6
30	902	.9
31	47	4
32	199	1.7
33	120	1.1
34	206	1.8
35	139	1.2
36	1156	10.1
Overall	**11408**	**100.0**

5. IMMUNIZATION COVERAGE

5.1 About 86 per cent of the children received both the doses. Those receiving only the second dose were 8 per cent. Further 2.5 per cent received only the first dose. Only 3.7 per cent received none of the doses. Thus, the programme reached over 96 per cent of target children. As high as about 88 per cent could be covered for the first dose and about 94 per cent for the second dose. Furthe 2.5 per cent of the children who got first dose dropped out for the second dose. City Slum wise results indicate more than 90 per cent coverage for both the doses in ten city slums (Pune, Madras, Madurai, Ahmedabad, Baroda, Hyderabad, Indore, Bhopal, Kanpur and Calcutta) between 80 to 85 per cent in 3 city slums (Nagpur, Bangalore and Mumbai) and less than 80 per cent in six city slums (Patna, Jaipur, Surat, Lucknow, Delhi and Ludhiana).

The coverage levels for both doses have been analysed according to the characteristics of the households and inferences on differences drawn using appropriate tests of significance. The results are discussed in the following sections.

TABLE 5.1

COVERAGE LEVEL ACCORDING TO CITIES (%)

CITY	N	NONE	DOSE I ONLY	DOSE II ONLY	BOTH
PATNA	600	9.7	4.8	12.0	73.5
BANGLORE	608	5.6	2.8	7.4	84.2
NAGPUR	600	.3	.0	19.5	80.2
PUNE	600	.2	1.2	1.7	97.0
JAIPUR	600	7.3	3.5	32.7	56.5
MADRAS	600	.3	.0	3.2	96.5
MADURAI	600	.2	.3	1.3	98.2
AHEMDABAD	600	2.7	.7	5.2	91.5
SURAT	600	11.0	4.2	5.3	79.5
BARODA	600	2.2	2.7	3.7	91.5
HYDERABAD	600	2.0	2.0	4.2	91.8
MUMBAI	600	.2	1.0	16.5	82.3
INDORE	600	.3	2.5	.0	97.2
BHOPAL	600	.2	3.3	.0	96.5
KANPUR	600	1.5	4.0	3.0	91.5
LUCKNOW	600	9.2	4.0	9.8	77.0
CALCUTTA	600	1.3	3.2	2.0	93.5
DELHI	600	7.3	3.3	13.8	75.5
LUDHIANA	600	9.7	3.2	16.0	71.2
ALL INDIA	**11408**	**3.7**	**2.5**	**8.3**	**85.5**

5.2 Age : The coverage levels although lower for the age group of 0-6 months, were not significantly different by age at the aggregate level (F = 1.98, d.f. = 4,9972).

TABLE 5.2

COVERAGE LEVEL ACCORDING TO AGE

CITY	AGE (in months)					
	0-6	7-12	13-18	19-23	25-30	>31
PATNA	55.4	75.8	67.9	78.5	76.1	78.6
BANGLORE	75.0	85.1	86.4	89.7	78.6	85.7
NAGPUR	55.9	84.4	76.1	82.2	80.5	85.1
PUNE	83.3	97.7	100.0	98.9	97.5	98.0
JAIPUR	36.4	59.3	63.2	63.4	68.0	47.5
MADRAS	72.5	98.0	99.2	99.1	100.0	97.2
MADURAI	88.2	99.4	99.1	99.0	100.0	97.8
AHEMDABAD	82.1	96.4	96.0	91.0	87.7	91.5
SURAT	68.6	85.3	80.5	79.4	75.4	82.6
BARODA	90.5	93.1	88.5	93.6	92.2	93.5
HYDERABAD	82.6	93.1	94.4	92.0	95.8	91.3
MUMBAI	83.2	78.3	72.7	91.3	93.3	84.4
INDORE	97.0	96.0	97.0	99.0	97.2	97.4
BHOPAL	96.1	96.5	99.0	96.3	96.6	94.7
KANPUR	83.1	90.3	93.7	94.1	92.5	91.6
LUCKNOW	61.3	73.9	84.5	78.9	82.6	77.6
CALCUTTA	90.8	94.6	95.1	93.8	96.4	89.2
DELHI	59.4	73.4	85.7	80.2	74.7	71.8
LUDHIANA	65.1	72.9	73.6	63.8	70.8	77.0
ALL INDIA	75.7	87.2	87.3	87.7	87.5	85.0

5.3 Sex : The coverage levels were same for male children as well as female children (t = 1.53, d.f. = 11407). For some of the cities the differences were significant. The coverage levels were higher for males as compared to females in the city of Patna, Lucknow by about 7 percentage points and in Surat, Mumbai, Pune and Baroda by 3 percentage points. In Delhi the coverage levels were higher for girls as compared to boys.

TABLE 5.3

COVERAGE LEVEL ACCORDING TO SEX (Per cent)

CITY	MALE	FEMALE
PATNA	**77.3**	**69.5**
BANGLORE	82.9	85.7
NAGPUR	79.7	80.6
PUNE	98.1	95.7
JAIPUR	55.4	57.6
MADRAS	96.0	96.9
MADURAI	92.3	90.6
SURAT	**81.4**	**77.1**
BARODA	93.0	89.8
HYDERABAD	92.1	91.6
MUMBAI	**85.0**	**79.2**
INDORE	97.4	96.9
BHOPAL	96.3	96.7
KANPUR	91.8	91.1
LUCKNOW	**80.0**	**73.7**
CALCUTTA	93.3	93.7
DELHI	73.6	77.7
LUDHIANA	71.1	71.2
Total	**86.0**	**85.0**

5.4 Religion and Caste : Coverage levels indicated significant differences among various religious groups. (F = 3.5, d.f. = 5,11407). Coverage levels were much lower among Muslims as compared to Hindus in the Patna, Surat, Kanpur, Lucknow, Calcutta, Delhi and Ludhiana. It was reverse in Hyderabad, Mumbai and Bangalore. By caste groups also the coverage levels indicated significant differences (F = 26.06, d.f. = 2,10805). The coverage levels were lower among SC and ST as compared to others in general. However, in Patna, Lucknow and Delhi the situation was reverse. For some of the cities, these differences were not significant.

TABLE 5.4

COVERAGE LEVEL ACCORDING TO RELIGION AND CASTE (Per cent)

CITY	RELIGION						CASTE		
	HINDU	MUSLIM	CHRIST.	JAIN	SIKH	OTHERS	SC	ST	OTHERS
PATNA	74.9	59.3	*	*	*	*	76.3	*	68.6
BANGLORE	83.1	87.4	86.7	*	*	*	82.9	76.7	86.1
NAGPUR	78.6	96.1	85.7	*	*	*	12.9	31.3	95.9
PUNE	97.1	96.7	85.7	*	*	*	98.3	93.8	97.1
JAIPUR	51.8	69.7	*	50.0	*	*	50.0	26.7	69.2
MADRAS	96.6	95.8	96.2	*	*	*	96.9	91.7	96.2
MADURAI	98.2	98.8	95.0	*	*	*	97.9	*	98.1
AHEMDABAD	91.4	91.5	*	*	*	*	94.4	*	90.8
SURAT	80.5	75.7	*	*	*	*	81.3	73.9	80.3
BARODA	91.6	91.6	*	*	*	*	92.8	93.9	90.0
HYDARABAD	91.6	93.2	83.3	*	*	*	91.1	87.1	92.4
MUMBAI	77.9	89.2	77.4	92.9	83.3	90.0	NA	NA	NA
INDORE	98.1	92.6	*	*	*	94.1	98.0	94.7	97.8
BHOPAL	96.6	96.0	*	*	*	*	95.7	96.6	96.8
KANPUR	92.8	85.0	*	*	*	*	90.4	83.3	94.4
LUCKNOW	82.5	69.1	*	*	*	*	87.0	65.5	76.3
CALCUTTA	94.3	88.4	*	*	*	*	95.3	*	92.8
DELHI	77.6	67.9	*	*	*	*	81.4	83.3	71.0
LUDHIANA	71.6	44.4	*	*	73.1	*	64.0	78.6	73.1
ALL INDIA	85.9	83.9	88.1	90.3	77.9	91.9	83.9	78.6	87.3

* Inadequate sample size.

5.5 Literacy : Coverage levels by literacy of mother (F=48.2, d.f. = 4,11403) and father (F= 34.3, d.f. = 4,11403)showed significant differences. The levels were much lower for children of both illiterate parents.

TABLE 5.5 (a)
COVERAGE LEVEL ACCORDING LITERACY (Per cent)

MOTHER'S & FATHER'S EDUCATION	TOTAL NO.	NONE		DOSE I ONLY		DOSE II ONLY		BOTH	
		Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
BOTH ILLITERATE	1993	193	9.7	92	4.6	190	9.5	1518	76.2
MOTHER LITERATE	413	13	3.1	4	1.0	26	6.3	370	89.6
FATHER LITERATE	2562	122	4.8	80	3.1	231	9.0	2129	83.1
BOTH LITERATE	6440	99	1.5	104	1.6	497	7.7	5740	89.1

TABLE 5.5 (b)
COVERAGE LEVEL ACCORDING LITERACY OF MOTHERS (Per cent)

CITY	EDUCATION OF MOTHER				
	ILLITERATE	PRIMARY	MIDDLE	SECONDARY	SR. SEC. & ABOVE
PATNA	72.0	77.1	81.4	90.0	71.1
BANGLORE	85.9	81.2	74.7	90.3	85.0
NAGPUR	.0	46.4	78.1	94.4	96.2
PUNE	96.8	98.3	98.1	97.6	95.3
JAIPUR	53.7	59.2	68.0	61.0	55.9
MADRAS	94.4	96.7	98.4	97.0	96.3
MADURAI	98.4	97.9	98.5	98.8	96.8
AHEMDABAD	89.3	96.1	90.7	93.3	96.8
SURAT	74.2	87.6	85.1	91.9	83.3
BARODA	88.5	94.7	92.1	91.8	100.0
HYDARABAD	86.9	93.4	97.6	95.6	91.8
MUMBAI	95.2	90.5	80.6	76.2	86.4
INDORE	96.9	98.1	97.5	95.7	97.0
BHOPAL	94.5	97.5	98.6	100.0	100.0
KANPUR	88.7	92.0	92.9	96.1	94.7
LUCKNOW	70.9	90.9	82.0	90.0	89.9
CALCUTTA	90.2	98.3	95.9	92.9	90.8
DELHI	73.7	70.6	87.2	87.5	93.3
LUDHIANA	56.8	70.5	85.3	78.1	76.6
ALL INDIA	**80.1**	**87.4**	**90.4**	**89.5**	**89.5**

For some of the towns viz Madras, Madurai, Indore and Pune, there were no differences in coverage by literacy of mother. In cities like Baroda, Hyderabad, Lucknow and Calcutta

the coverage level were lower for illiterate mothers but for all literate categories, there were no differences.

TABLE 5.5 (c)

COVERAGE LEVELS ACCORDING TO LITERACY OF FATHERS (Per cent)

CITY	EDUCATION OF MOTHER				
	ILLITER-ATE	PRIMARY	MIDDLE	SECONDARY	SR. SEC. & ABOVE
PATNA	66.8	81.0	77.3	84.4	77.8
BANGLORE	86.4	77.3	83.3	85.8	84.7
NAGPUR	.0	34.8	61.9	70.8	93.9
PUNE	100.0	95.8	96.7	97.5	96.4
JAIPUR	50.5	54.9	59.6	59.2	57.1
MADRAS	96.4	98.7	94.4	94.9	98.8
MADURAI	97.8	98.0	98.3	99.1	97.2
AHEMDABAD	91.8	87.2	91.2	96.6	88.8
SURAT	75.5	80.6	76.7	84.9	86.7
BARODA	94.4	88.9	91.4	90.9	93.9
HYDARABAD	84.8	93.4	92.9	96.4	93.5
MUMBAI	90.0	100.0	86.7	82.4	78.3
INDORE	94.3	100.0	97.5	90.9	98.0
BHOPAL	94.2	94.9	96.7	98.5	98.7
KANPUR	86.1	93.8	93.0	95.1	90.8
LUCKNOW	69.4	61.3	88.9	77.4	91.8
CALCUTTA	88.1	94.4	97.7	91.2	94.2
DELHI	68.8	72.8	70.0	83.8	91.5
LUDHIANA	47.7	68.3	80.5	78.8	74.5
ALL INDIA	78.5	84.7	87.8	87.6	88.5

For some of cities viz, Banglore, Pune, Madras, Madurai, Ahmedabad, Baroda, Indore and Bhopal, there were no differences in coverage by literacy of father. However, in Patna, Jaipur, Surat, Hyderabad, Kanpur, Calcutta and Ludhiana, the coverage were lower for children of illiterate father but for all literate categories, there were no differences.

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6.1 : Information on reasons for non-immunization was collected for those who did not receive any of the doses as well as from those who received only the first dose. The results are presented for these two categories in table 6.1. For those who did not receive any of the doses, not aware of the days of immunization was the reason reported by about 42 per cent followed by having no faith 11 per cent and Absent/Out of station were about 5 percent. In 23.4 per cent of the cases reasons given were not specified. The reasons for partial immunization were not aware of the days by 20%. In about 31 per cent of the cases, the reasons for partial immunisation were, out of station/ absent/child was not available. Reasons were not specified in about 19 percent.

TABLE 6.1

REASONS FOR NON-IMMUNIZATION (PER CENT)

REASON	NONE	PARTIAL
NOT AWARE OF DAYS	41.7	20.4
HAVE NO FAITH	11.2	5.0
AS DOCTOR ADVISED	2.6	2.1
NOT CONVINCED	4.9	5.7
RECENTLY VACCINATED	8.2	3.2
ABSENT/ OUT OF STATION	5.2	31.1
NOT SPECIFIED	23.4	19.3
NA	2.8	13.2
TOTAL (N)	**427**	**280**

6.2 Reasons for non-immunizations by sex and age of the child do not indicate any significant differences. The religion-wise analysis of reasons for non-immunization indicate that sizable proportion of families of christian/jain and others were influenced by their family doctor.

TABLE 6.2 (a)

REASONS FOR NON IMMUNIZATION BY SEX & AGE (PERCENTAGE)

REASON FOR NON-IMMUNIZATION	SEX		AGE (in months)					
	MALE	FEMALE	0-6	7-12	13-18	19-23	25-30	>31
n	5969	5439	1431	2416	2184	1844	1666	1867
NOT AWARE OF DAYS	2.2	2.4	3.1	1.7	2.0	2.0	2.3	3.0
HAVE NO FAITH	.5	.7	.4	.7	.5	.9	.2	.8
AS DOCTOR ADVISED	4.4	4.0	5.0	5.2	3.8	4.3	2.5	4.1
NOT CONVINED	:9	1.1	.7	1.3	1.1	1.2	1.0	.7
RECENTLY VACCINATED	.3	.6	.7	.4	.3	.3	.4	.5
OTHERS	10.8	11.8	10.9	11.6	11.2	11.3	10.9	11.5
NA	80.9	79.4	79.1	79.1	81.2	79.9	82.7	79.4

TABLE 6.2 (b)

REASONS FOR NON IMMUNIZATION BY RELIGION (PERCENTAGE)

REASON FOR NON-IMMUNIZATION	RELIGION					
	HINDU	MUSLIM	CHRIST.	JAIN	SIKH	OTHERS
n	8810	2112	201	31	131	123
NOT AWARE OF DAYS	2.3	2.4	.0	3.2	4.6	.8
HAVE NO FAITH	.5	1.2	.5	3.2	.8	.0
AS DOCTOR ADVISED	2.9	4.8	20.9	29.0	6.9	50.4
NOT CONVINED	1.1	.8	.0	.0	.8	.0
RECENTLY VACCINATED	.4	.5	.5	.0	.0	.0
OTHERS	10.5	14.1	9.0	19.4	8.4	24.4
NA	82.3	76.1	69.2	45.2	78.6	24.4

6.3 The reasons at the City Level are given in annexures 5 and 6. Although the trends revealed was broadly similar, there were differences in the reasons across city.

7. SOURCE OF AWARENESS :

7. 1 The main source of awareness for most of the beneficiary households were health workers and T.V. Anganwadi workers also played a key role in generating the awareness. Teacher, relative, friend also served as source of information. It may be mentioned that among those who did not avail of any of the doses, about 50 per cent were aware of the programme, but did not go for immunization, additional motivation efforts are desired. This is in particular significant in the slums of Patna (64%), Jaipur (50%), Ahmedabad (62.5%), Surat (48.5%), Hyderabad (58.3%), Kanpur (77.5%) and Delhi (54.5%).

TABLE 7.1

SOURCE OF AWARENESS - NONE (Per cent)

AWARENESS	NONE	DOSE-I ONLY	DOSE-II ONLY	BOTH
HEALTH WORKER	11.0	18.9	30.2	34.7
ANGANWADI WORKER	6.1	11.4	12.2	17.5
RELATIVE	1.9	3.6	4.7	2.8
FRIEND	4.7	6.1	6.5	3.6
TEACHER	.5	3.6	2.4	3.9
TV	10.1	19.3	33.2	27.3
RADIO	1.2	2.5	3.9	3.6
OTHERS	13.3	12.9	6.6	6.6
NEVER HEARD	51.3	21.8	.4	.1
n	427	280	944	9757

The results at the town level are presented in annexure 7. The health worker Anganwadi worker remained the main source of awareness in all towns and for all categories. T.V. also played crucial role.

7.2 With a view to understand the differentials, if any, in the source of awareness by religion, caste, residence, literacy, the results according to background characteristics of the households are presented in tables 7.2 (a) & 7.2(b). Health workers and T.V. were the main source of awareness among all religious and social groups. Anganwadi workers contributed next in generating awareness. Relative and friends also helped towards this. There were no association seen between religion and source of awareness.

TABLE 7.2 (a)

SOURCE OF AWARENESS BY RELIGION (Per cent)

AWARENESS	RELIGION					
	HINDU	MUSLIM	CHRIST.	JAIN	SIKH	OTHERS
HEALTH WORKER	34.1	29.7	39.3	25.8	22.1	15.4
ANGANWADI WORKER	16.5	18.3	9.0	6.5	9.2	7.3
RELATIVE	2.8	2.9	6.0	3.2	3.1	6.5
FRIEND	3.8	4.8	5.0	3.2	.8	.8
TEACHER	3.6	4.3	2.0	.0	.8	.8
TV	26.1	28.5	26.4	35.5	45.8	38.2
RADIO	3.8	2.4	5.5	.0	.8	1.6
OTHERS	6.8	5.7	6.0	22.6	13.0	28.5
NEVER HEARD	2.4	3.5	1.0	3.2	4.6	.8

TABLE 7.2(b)

SOURCE OF AWARENESS BY CASTE (Per cent)

AWARENESS	CASTE		
	SC	ST	OTHERS
HEALTH WORKER	40.6	36.5	30.8
ANGANWADI WORKER	16.5	28.6	15.7
RELATIVE	1.9	3.4	3.0
FRIEND	3.4	2.8	4.5
TEACHER	4.0	2.2	3.9
TV	19.5	19.2	30.0
RADIO	2.8	1.5	4.2
OTHERS	8.9	2.8	5.2
NEVER HEARD	2.6	3.2	2.6

TV as source of information was significantly higher in others as compared to SC & ST.

BASIC DEMOGRAPHIC INDICATIONS AND VITAL RATES FOR STATES AND INDIA

Index	India	Andhra Pradesh	Assam	Bihar	Gujarat	Haryana	Himachal Pradesh	Karnataka	Kerala	Madhya Pradesh	Maharashtra	Orissa	Punbjab	Rajasthan	Tamil Nadu	Uttar Pradesh	West Bengal
Population - 1991 (million)	846	66.5	22	86	41	16.5	5	45	29	66	78.9	31.7	20.8	44	56	139	68
Density (Population/km) (1991)	273	242	286	497	211	372	93	235	749	149	257	203	403	129	428	473	767
Per cent urban (1991)	26.1	26.9	11.1	13.1	34.5	24.6	8.7	30.9	26.4	23.2	38.7	13.4	29.6	22.9	34.2	19.8	27.5
Sex ratio (1991)	927	972	923	911	934	865	976	960	1036	932	935	971	882	910	972	879	917
Per cent Scheduled Caste (1991)	16.7	15.9	7.4	14.6	7.4	19.8	25.3	16.4	9.9	14.5	11.1	16.2	28.3	17.3	19.2	21.0	23.6
Per cent Scheduled Tribe (1991)	8.0	6.3	12.8	7.7	14.9	0.0	4.2	4.3	1.1	23.3	9.3	22.2	0.0	12.4	1.0	0.2	5.6
Per cent Literate (1991)																	
Male	64.1	55.1	61.9	52.5	73.1	69.1	75.4	67.3	93.6	57.4	74.8	63.1	65.7	55.0	74.9	55.4	67.8
Female	39.3	32.7	43.0	22.9	48.6	40.5	52.1	44.3	86.2	28.4	50.5	34.7	50.4	20.4	52.3	26.0	46.6
Total	52.2	44.1	52.9	38.5	61.3	55.9	63.9	56.0	89.8	43.4	63.1	49.1	58.5	38.6	63.7	41.7	57.7
Crude birth rate (1992)	29.2	24.1	31.3	32.3	27.9	31.9	27.9	26.2	17.7	34.4	26.2	27.8	27.1	34.7	21.6	35.7	24.8
Crude death rate (1992)	10.1	9.1	10.3	10.9	9.1	8.6	8.8	8.5	6.3	12.7	8.2	11.7	8.2	10.4	8.8	11.3	8.4
Total Fertility Rate (1992)	3.6	3.0	3.5	4.4	3.1	4.0	NA	3.1	1.8	3.9	2.9	3.3	3.1	4.6	2.5	4.8	2.9
Infant Mortality Rate (1992)	79	71	76	73.0	67	75	67	73	17	104	50	114	56	89	67.7	99.9	65
Under Five Mortality*	109.3	96.0	142.2	127.5	104	98.7	85.0	102.2	32	130.3	70.3	131.0	68.0	102.6	86.5	141.3	107.3
Life Expectancy (1986-90)																	
Male	57.7	59.1	53.6	55.7	58.3	63.4	NA	62.1	66.8	56.2	61.9	57.1	64.7	55.2	60.8	54.1	60.2
Female	58.1	62.2	54.2	53.6	61.5	62.0	NA	63.3	72.3	54.7	62.9	55.1	66.9	56.2	60.8	49.6	61.2

* Source : NFHS

REASONS FOR NON - IMMUNIZATION : (Per cent)

Reason For Non-Immunization	Andhra Pradesh	Assam	Bihar	Gujarat	Haryana	Himachal Pradesh	Karnataka	Kerala	Madhya Pradesh	Maharashtra	Orissa	Punjab	Rajasthan	Tamil Nadu	Uttar Pradesh	West Bengal	North West	U.Ts.	India
n	19	9	37	18	8	7	30	3	18	38	10	0	19	8	52	38	28	10	352
Not Aware Of Days	16.0	55.6	25.0	33.3	12.5	42.9	30.0	0.0	26.3	0.0	10.0	-	40.9	25.0	32.7	26.3	35.7	30.0	26.1
Have No Faith	24.0	0.0	5.6	11.1	0.0	0.0	43.3	0.0	0.0	2.6	40.0	-	13.6	0.0	15.4	15.8	3.6	0	12.7
As Doctor Advised	8.0	0.0	0.0	5.6	0.0	14.3	6.7	0.0	0.0	2.6	0.0	-	27.3	0.0	0.0	5.3	3.6	10.0	4.7
Not Convinced	0.0	0.0	0.0	0.0	0.0	14.3	0.0	0.0	10.5	2.6	10.0	-	0.0	0.0	1.9	15.8	10.7	30.0	5.0
Recently Vaccinated	0.0	0.0	0.0	0.0	12.5	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	3.8	0.0	0	10.0	1.1
No Time/Not Convenient	0.0	0.0	0.0	5.6	25.0	0.0	0.0	0.0	0.0	0.0	20.0	-	0.0	0.0	0.0	0.0	0	0	1.3
Child Too Small	0.0	0.0	0.0	0.0	25.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0	0	0.5
Obstacle	28.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0	0	2.0
Absent	0.0	0.0	41.7	0.0	25.0	0.0	3.3	0.0	0.0	18.4	0.0	-	9.1	12.5	3.8	0.0	0	0	8.3
Fear Of Disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0	0	0.0
Child Ill	0.0	0.0	0.0	0.0	0.0	14.3	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0	0	0.3
Not Informed	0.0	0.0	0.0	0.0	0.0	14.3	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0	0	0.3
Not Specified	24.0	11.1	27.8	27.8	0.0	0.0	16.7	66.7	57.9	71.1	0.0	-	9.1	62.5	42.3	36.8	46.4	20.0	34.7
NA	0.0	33.3	0.0	16.7	0.0	0.0	0.0	33.3	5.3	2.6	20.0	-	0.0	0.0	0.0	0.0	0	0	3.0

REASON FOR PARTIAL-IMMUNIZATION : (Per cent)

Reason For Non-Immunization	Andhra Pradesh	Assam	Bihar	Gujarat	Haryana	Himachal Pradesh	Karnataka	Kerala	Madhya Pradesh	Maharashtra	Orissa	Punjab	Rajasthan	Tamil Nadu	Uttar Pradesh	West Bengal	North East	U.Ts.	India
N	129	31	195	82	30	26	42	30	111	168	60	85	182	67	178	58	251	19	1744
Not Aware Of Days	8.0	11.1	0.0	4.0	0.0	22.2	0.0	0.0	10.0	5.9	9.5	-	0.0	28.6	34.0	9.3	25.0	25.0	16.9
Have No Faith	20.0	0.0	0.0	4.0	0.0	11.1	0.0	0.0	0.0	0.0	9.5	-	14.3	0.0	0.0	16.3	0	0	4.7
As Doctor Advised	0.0	0.0	0.0	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	14.3	0.0	1.0	2.3	3.1	0	1.6
Not Convinced	0.0	11.1	5.6	4.0	0.0	11.1	0.0	0.0	5.0	0.0	0.0	-	0.0	0.0	2.9	0.0	0	0	2.3
Recently Vaccinated	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	14.3	14.3	2.9	4.7	0	0	1.9
No Time	0.0	0.0	0.0	12.0	0.0	0.0	0.0	0.0	0.0	0.0	4.8	-	0.0	0.0	0.0	0.0	0	0	1.1
Child Too Small	0.0	0.0	0.0	0.0	16.7	44.4	0.0	0.0	0.0	17.6	9.5	-	28.6	14.3	1.9	23.3	0	0	7.2
Obstacle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.5	-	0.0	0.0	0.0	0.0	0	0	0.5
Absent	24.0	33.3	94.4	24.0	33.3	0.0	50.0	0.0	75.0	5.9	19.0	-	28.6	42.9	13.6	0.0	0	0	21.5
Fear Of Disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	9.3	0	0	1.1
On Delivery	0.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0	0	0.3
Complete of Three Doses	4.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	1.9	14.0	0	0	2.8
Child Ill	0.0	0.0	0.0	0.0	0.0	0.0	16.7	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0	0	0.3
Not Informed	0.0	0.0	0.0	0.0	0.0	11.1	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0	0	0.3
Not Specified	44.0	22.2	0.0	12.0	50.0	0.0	33.3	0.0	5.0	0.0	4.8	-	0.0	0.0	41.7	18.6	71.9	50.0	28.2
NA	0.0	22.2	0.0	24.0	0.0	0.0	0.0	100.0	5.0	70.6	33.3	-	0.0	0.0	0.0	2.3	0	25.0	9.4

SOURCE OF AWARENESS AMONG PARENTS

Source	Andhra Pradesh	Assam	Bihar	Gujarat	Haryana	Himachal Pradesh	Karnataka	Kerala	Madhya Pradesh	Maharashtra	Orissa	Punjab	Rajasthan	Tamil Nadu	Uttar Pradesh	West Bengal	North East	U.Ts.	India
Health Worker	49.3	49.5	23.1	60.3	27.8	69.4	39.1	81.7	51.7	38.6	59.9	28.3	25.0	48.4	40.7	58.7	31.6	42.5	44.5
Anganwadi Worker	6.8	26.7	7.1	14.0	39.8	10.6	41.8	13.5	9.5	31.6	29.0	4.5	10.6	33.0	13.1	7.8	23.7	24.5	18.0
Relative	0.5	3.7	1.0	2.4	1.7	0.9	0.5	0.0	4.6	3.7	1.3	1.2	6.3	1.1	3.9	1.8	6.0	0.4	2.6
Friend	0.8	3.4	0.4	0.3	2.6	0.7	1.4	0.5	1.2	2.3	2.0	2.4	28.8	2.8	7.5	0.8	3.7	0.9	2.4
Teacher	3.2	1.0	16.9	2.8	0.7	0.2	3.3	0.4	7.4	1.4	0.7	4.4	36.8	3.8	4.2	0.2	2.2	2.1	5.6
TV	17.9	7.8	10.9	10.4	20.7	11.3	5.7	2.0	8.5	13.1	2.5	23.2	6.6	4.5	12.2	9.1	8.4	21.0	10.7
Radio	8.0	1.7	7.8	0.3	0.7	1.6	5.0	1.3	1.0	2.2	1.0	1.1	2.4	3.4	6.3	6.1	3.6	1.7	3.4
Others	13.2	5.5	32.2	8.9	5.9	4.6	0.9	2.2	15.5	5.5	3.5	35.3	9.4	2.4	11.6	14.5	18.8	6.2	12.0
Never Heard	0.3	1.1	0.5	0.9	0.7	0.5	2.2	0.2	0.8	0.1	0.0	0.0	0.0	0.7	0.7	0.0	1.8	0.6	0.6
N	600	600	1211	637	600	631	600	600	1229	1200	600	600	601	607	1826	603	547	520	13812

Annexure-5

REASONS FOR NON-IMMUNIZATION (Per cent)

Reason For Non Immunization	City																	
	Patna	Banga lore	Nagpur	Pune	Jaipur	Madras	Madurai	Ahmeda bad	Surat	Baroda	Hydera bad	Mumbai	Indore	Bhopal	Kanpur	Luck now	Calcutta	Delhi	Ludh iana
N	58	34	2	1	44	2	1	16	66	13	12	1	2	1	9	57	8	44	58
Not Aware Of Days	43.1	67.6	.0	.0	13.6	.0	100.0	31.3	47.0	23.1	41.7	.0	100.0	.0	22.2	50.9	.0	29.5	58.6
Have No Faith	.0	5.9	.0	100.0	29.5	.0	.0	6.3	7.6	.0	41.7	.0	.0	.0	.0	14.0	50.0	6.8	10.3
As Doctor Advised	.0	.0	.0	.0	6.8	.0	.0	.0	1.5	.0	.0	100.0	.0	.0	.0	.0	25.0	.0	6.9
Not Convined	.0	.0	9.1	.0	13.6	.0	.0	6.3	6.1	.0	.0	.0	.0	.0	.0	3.5	25.0	2.3	8.6
Recently Vaccinated	12.1	14.7	.0	.0	6.8	.0	.0	6.3	4.5	30.8	.0	.0	.0	.0	.0	3.5	.0	15.9	5.2
Others	43.1	11.8	.0	.0	29.5	50.0	.0	50.0	33.3	46.2	16.7	.0	.0	100.0	66.7	19.3	.0	40.9	8.6
NA	1.7	.0	90.9	.0	.0	50.0	.0	.0	.0	.0	.0	.0	.0	.0	11.1	8.8	.0	4.5	1.7

Annexure-6

REASONS FOR PARTIAL-IMMUNIZATION : (Per cent)

Reason For Non Immunization	City																		
	Patna	Banga lore	Nagpur	Pune	Jaipur	Madras	Madurai	Ahmeda bad	Surat	Baroda	Hydera bad	Mumbai	Indore	Bhopal	Kanpur	Luck now	Calcutta	Delhi	Ludh iana
N	29	17	0	7	21	0	2	4	25	16	12	6	15	20	24	22	19	20	19
Not Aware Of Days	31.0	11.8	.0	.0	14.3	.0	50.0	.0	20.0	6.3	25.0	100.0	20.0	15.0	.0	27.3	15.8	10.0	47.4
Have No Faith	3.4	.0	.0	.0	14.3	.0	.0	.0	4.0	.0	25.0	.0	.0	.0	4.2	9.1	10.5	.0	5.3
As Doctor Advised	.0	.0	.0	14.3	.0	.0	.0	.0	4.0	6.3	.0	.0	.0	.0	.0	4.5	.0	.0	10.5
Not Convined	.0	11.8	9.1	.0	38.1	.0	.0	50.0	12.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	5.3
Recently Vaccinated	.0	5.9	.0	.0	.0	.0	.0	.0	.0	.0	8.3	.0	.0	.0	25.0	.0	.0	5.0	.0
Others	62.1	64.7	.0	.0	28.6	.0	50.0	50.0	52.0	62.5	33.3	.0	40.0	85.0	66.7	18.2	73.7	80.0	15.8
NA	3.4	5.9	.0	85.7	4.8	.0	.0	.0	8.0	25.0	8.3	.0	40.0	.0	4.2	40.9	.0	5.0	15.8

Annexure-7

SOURCE OF AWARENESS (OVERALL) (Per cent)

Reason For Non Immunization	City																	
	Patna	Banga lore	Nagpur	Pune	Jaipur	Madras	Madurai	Ahmeda bad	Surat	Baroda	Hydera bad	Mumbai	Indore	Bhopal	Kanpur	Luck now	Calcutta	Delhi	Ludh iana
N	600	608	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600
Health Worker	37.2	37.2	.0	40.3	17.3	76.3	82.2	37.0	47.3	18.7	51.8	11.7	19.3	22.0	45.2	13.8	16.7	27.2	26.5
Anganwadi Worker	6.2	20.4	20.2	3.7	3.7	4.8	4.5	23.3	25.7	61.5	15.5	11.8	48.2	28.5	5.2	15.3	1.8	10.8	2.0
Relative	.0	6.4	1.8	2.2	3.7	.0	1.3	10.2	2.8	1.2	1.3	7.3	2.2	2.3	2.2	3.2	1.8	2.3	3.3
Friend	.0	9.9	2.3	2.0	3.7	.0	.7	.8	.3	1.2	1.7	2.2	1.8	4.0	5.2	20.0	1.5	12.7	5.0
Teacher	19.7	5.8	2.5	1.0	.8	.8	1.2	7.5	1.8	.3	2.7	.0	5.0	7.2	1.7	1.8	.3	5.2	3.5
TV	7.0	11.3	48.8	42.3	58.7	10.5	4.8	11.8	8.0	9.2	19.7	42.8	21.7	33.0	30.0	34.5	46.5	30.8	40.2
Radio	.0	1.3	23.8	6.2	1.8	6.8	5.3	2.7	.5	2.2	.7	1.7	.5	.3	6.8	3.0	.8	1.5	.7
Others	24.8	3.0	.5	1.7	5.3	.5	.0	5.7	7.2	3.5	4.7	21.0	.2	2.0	3.3	1.5	28.7	5.7	13.3
Never Heard	5.2	4.8	.0	.7	5.0	.2	.0	1.0	6.3	2.3	2.0	1.5	1.2	.7	.5	6.8	1.8	3.8	5.5

A PROCESS EVALUATION OF PULSE POLIO IMMUNIZATION

Jotna Sokhey[**], Stephen Atwood[*], Jon Andrus[*], K. Suresh[*] and K. Banerjee[**]

On 9 December 1995 and 20 January 1996, the Government of India (GOI) initiated the first round of its polio eradication strategy; two single-day mass immunizations of children less than three years old with oral polio vaccine (OPV). This Pulse Polio Immunization (PPI) strategy represented a massive logistical and community mobilization initiative, which was planned over a period of approximately six months.

In order to provide a critique of the first day of the PPI (9 December) that could lead to improvement on Day 2 (20 January), the Ministry of Health and Family Welfare (MCH Section), UNICEF and WHO designed a rapid qualitative evaluation of the day by independent observers spread throughout the country. In addition to providing timely information for mid-course correction in Round 1, the group was also experimenting with a new, rapid and inexpensive method of data collection using a modified mail-in survey.

Methodology

A three-part instrument was developed in New Delhi. Part 1 interviewed the principal coordinator at each immunization post (IP); Part 2 was for recording the observations of the surveyor; and Part 3 was a protocol for exit interviews of four participants in the program. Each part of the instrument was designed to take less than five minutes to complete giving a total maximum time of 30 minutes for a full observation of one Immunization Post (IP) to be completed. It was anticipated that each volunteer would visit one IP.

Two thousand protocols were printed and distributed through regular mail service to volunteers from different professional fields throughout the country. Initially, volunteers were identified as government officials, faculty members of various medical schools including Departments of Community Medicine and Pediatrics, Rotarians, Medical staff, Delhi-based WHO/UNICEF staff, UNICEF field staff and members of other supporting donor agencies. The total number of protocols distributed cannot be determined, as some volunteers independently photocopied the forms and distributed them to colleagues. All volunteers were asked in an accompanying letter to fill in each of the protocols and return them to a common address in the Ministry of Health and Family Welfare (MOHFW).

Analysis of returned protocols was begun by UNICEF office staff (four staff for three days), and later finalized by 11 medical students (three days each) from two medical colleges[1]. Under the guidance of Dr. K. Suresh, results were collated and verbatim responses recorded. As the protocol was designed to record primarily qualitative data, it was not coded for quantitative (computerized) analysis. This was in part because the size of the response was not anticipated.

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[1] *Six students from Rohtak Medical College, Rohtak, Haryana and three students from Lady Hardinge Medical College, New Delhi.*

Results

A total of 1070 forms were returned denoting the observations of the same number of IPs. The total cost of the evaluation was Rs. 17000. Of the 1070 forms received, some were incomplete in all responses; therefore, the denominator was not constant for different variables. The salient findings are summarized below.

Distribution of Immunization Posts Visited

A total of 1070 IPs in 25 out of the 31 states and UTs (including all major states) spread over 167 districts were visited by observers (Table I). Of the 1070 posts visited, 54% were urban, 28% rural, 13% urban slum, 2% transit points and the remaining were re-settlement colonies and tribal areas. In about 3% of the forms, the type of booth visited was not clearly indicated.

Respondents

The observers (n=930) included medical college faculty (22%), government officers from Health

TABLE 1

DISTRICTS AND PPI BOOTHS VISITED BY OBSERVERS

Sl.No.	State	Districts visited	Posts visited
1.	Kerala	7	28
2.	Andhra Pradesh	10	61
3.	Karnataka	7	47
4.	Chandigarh	3	29
5.	Madhya Pradesh	7	55
6.	Bihar	10	23
7.	Tamil Nadu	19	241
8.	Jammu & Kashmir	4	7
9.	Uttar Pradesh	14	86
10.	Rajasthan	11	108
11.	Himachal Pradesh	6	22
12.	Gujarat	11	56
13.	West Bengal	11	66
14.	Delhi	1	60
15.	Haryana	10	33
16.	Orissa	11	39
17.	Dadra & Nagar Haveli	1	7
18.	Assam	2	8
19.	Pondicherry	1	6
20.	Maharashtra	11	48
21.	Punjab	4	30
22.	Meghalaya	2	5
23.	Goa	2	2
24.	Manipur	1	2
25.	Lakshadweep	1	1
	Total	**167**	**1070**

and other departments (33%), Rotarians (8%), UNICEF/WHO staff (23%), and NGOs and other (14%). Some respondents visited more than one IP.

Immunization Post Staffing and Skills

Of a total of 735 PPI co-ordinators interviewed, 33% were medical doctors, 27% were health and other government staff, 2% teachers, 38% NGOs and others. A number of forms indicated the name of the person only, without the designation, making it difficult to categorize with specificity. Hence, the proportion of 'others' appears to be high.

As against the suggested personnel of at least four persons per PPI booth, more than 85% had four or more persons, suggesting that adequate numbers of personnel were deployed. The personnel included health staff (27%), teachers (17%), NGO (10%), Anganwadi workers (11%), students (13%), community volunteers (13%) and others (9%).

Only 5% (215 out of 4000+ observed) of the children were observed being given more than 2 drops of OPV. Underdosage was recorded for only 12 children. Lack of accuracy in dosage was felt mainly to be due to the difficulty in handling the vaccine vial cap by newly trained personnel.

The record maintenance was done using pre-printed tally sheets (34%), names being written (33%), ticked in enumeration list (27%) and the remaining by other means. Multiple record maintenance was also reported in around 400 booths.

Vaccines and Cold Chain

In general, the vaccine supply was recorded as adequate. In approximately 8% of booths a shortage of vaccine was noted, and in about 5% of the booths, delayed arrival of vaccine was reported. Qualitative reports indicated that wherever a shortage was observed, arrangements were made from the nearest store. Example of one state, Orissa, giving vaccine to the neighboring state of Bihar is considered worth mentioning as it cut across normal procedures.

Vaccines were carried to 87% of IPs in cold chain equipment such as vaccine carriers and day carriers. In 13% of the booths visited (mainly urban), vaccines were received in thermocol boxes or thermos flask, if vaccine carriers were not available. Thirty seven out of 1033 booths (3.6%) recorded for this variable did not have frozen ice in the vaccine carriers at the time of the visit, mainly in the late afternoon sessions. The problem appeared to be more in Rajasthan (13%) and Uttar Pradesh (7%).

Communication and Outreach

Only 25 out of the 1033 booths visited were reported to be not easily identifiable. All the PPI booths visited had communication material, the commonest being banners (37%), posters (33%), stickers (13%), flags (8%) and others (9%). The sources of information regarding the PPI were Television (21%), health staff (19.5%), radio (11%), posters, hoardings etc. (9%) relatives (10%), loud speakers (9%), Anganwadi workers (5%), teachers (6%), and students and others volunteers (9.5%). Other IEC activities were also reported like rallies of school children, house-to-house distribution of communication material and announcement by loud speakers.

About 15% of the PPI post coordinators were aware of the areas of their communities from where children might not visit and reported having taken or planned suitable action to cover these

areas. Among the most commonly identified "difficult to reach" were children from Scheduled Caste/Scheduled Tribe colonies and higher income residential areas, parents advised by the family physicians that their children may not require vaccination, and those preferring to go to their private doctors. The majority of booths, however, did not report areas where coverage would be of concern.

Community members and observers remarked positively on the involvement of all governmental and non-governmental sectors contributing together. Many examples were given of health staff, Anganwadi workers, teachers, Rotarians, and other NGOs working together.

Recipients

All but a negligible number (0.2%) children visiting the booths were immunized. Those not immunized were reported to be because of being over age, shortage of vaccine, or history of fever. In less than 3% (n=33) of IPs, the age of the children was not being checked. This problem was reported in 9 out of 85 booths visited in Uttar Pradesh and 4 out of 39 in Orissa. About 16% (605 out of 3716) of the children observed being immunized were over three years of age.

Community Education

Nearly 15% of the people accompanying the child were not aware of the name of the vaccine received while 20% were not aware of the next PPI day. Most of the people interviewed (89%) knew the purpose of drops being given (i.e., polio prevention/eradication, prevent disabilities). However, some of the comments revealed a lack of complete understanding of the purpose of the immunization: "prevent tetanus", "no disease will occur in future", "prevent tuberculosis", "useful for the body," "my child will never have cough and cold again", "will not get malaria", etc.

Suggestions for Improvement

The following suggestions for improvement emanated from Observers and IP co-ordinators : (i) Declare the PPI day as a national holiday to facilitate bringing children to the booth; (ii) To Open more PPI booths in highly congested areas, as well as sparsely populated areas; (iii) Use Cable Television as a medium for IEC awareness to capture the upper-middle class and upper class; (iv) Orient, inform and involve more private practitioners; (v) Vaccines should be received well in advance to minimize anxiety; (vi) Make provision for proper cold chain equipment (avoiding thermocol boxes); (vii) Improve the quality of the nozzle and lid material of the vaccine vial to facilitate dropping the vaccines; (viii) Improve physical facilities at the IP (seating arrangements, proper shelter to prevent vaccines from getting exposed to the sun, drinking water, etc.) (ix) Better facilities to the people working at PPI booths (transport, working lunch and compensatory day off for working on a holiday); and (x) Increase the quantity of hand bills, stickers and other communication material to distribute to every household.

Similar suggestions from parents included : (i) More advanced intimation about the PPI in low socio-economic sectors; (ii) Provide a mobile PPI centre to cover the low socio-economic area; (iii) Provide adequate drinking water near PPI post; (iv) Offer an incentive to children (milk, toffees, biscuits etc.); (v) Use the same logo every year; not only for polio but for other preventable diseases as well; (vi) Print the dates of the PPI days on the ration card; and (vii) Avoid making children wait for the sake of inaugural functions, visit of dignitaries, delayed vaccines, etc.

Discussion

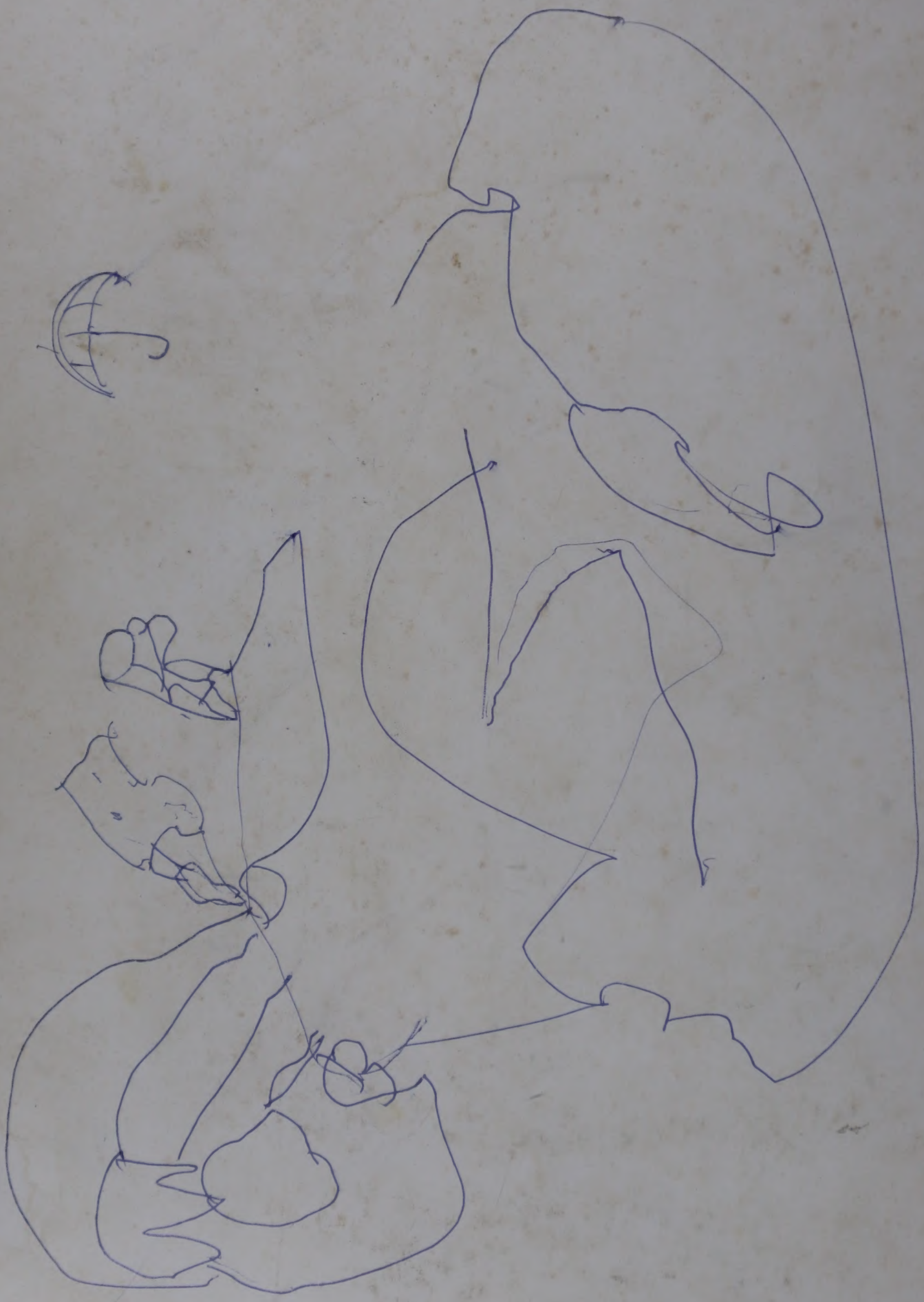
Clearly, the PPI day on 9 December represented a remarkable achievement of community mobilization, logistical support, and community participation. These data suggest that the vaccine supply appeared adequate; only 5% children received more than 2 drops of OPV; posts were easily identifiable; and virtually none of the children were turned away. However, of concern 20% of the parents or guardians did not know of the dates of second round of the PPI.

The importance of television as a means of communication was reported, although the preponderance of surveys done in urban centers where access to televisions is greater than in rural areas may in part explain this. Communication by individuals also was underscored as an important means of social mobilization.

An important finding of the survey was the lack of understanding of some family members of the reason for polio immunization and their unrealistic expectations of its effect. This could become important for subsequent immunization days, as unrealized expectations may lead to disenchantment with the program and a reduction in community participation. The response could be improved by an increase in the educational nature of the materials provided to the community. The data from this survey suggests that sufficient staff are present at each IP to make this possible.

The use of this low-cost survey method proved effective in providing decision makers with timely information necessary to revise subsequent PPI days and to confirm that a massive public health programme was effectively managed. Despite the non-random sampling, information was collected from a sufficient number of respondents to allow for patterns of strengths and shortcomings to be detected, and conclusions to be drawn for subsequent actions. The survey was not intended to replace a coverage survey nor an ongoing system of surveillance for Acute Flaccid Paralysis (AFP) which should constitute the ultimate evaluation of any such polio eradication programme. Both of these are being taken up by the Government. The purpose was to get, from as many different perspectives as possible, a composite picture of the PPI process. In this regard, its purpose was not unlike the triangulation exercises used in Participatory Rural Appraisal.

The specific nature of some observations indicate that the data should be used as close to the point of collection as possible, not necessarily for determination of National policy, although some of the innovative ideas deserve application on a wide scale. The simplicity of the survey method, however, should encourage localities to do this exercise on their own.

The rapid low-cost and easy to implement and qualitative evaluatory process also provided an indication that the country had the capacity to utilize more than 150 million doses of OPV on a single day. Other more statistically valid surveys are contemplated. Surveillance of AFP has also started to document the impact of PPI on the incidence of poliomyelitis.

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